SUMMARY

S.1 Introduction

This draft environmental document (DED) provides the review and analysis required by California Environmental Quality Act (CEQA) Guidelines to assist the State's Fish and Game Commission in regulating the commercial harvest of Pacific herring throughout ocean and estuarine waters. Specifically, the DED reviews and evaluates proposed regulations and selected alternatives for the 1998-99 fishing season. A Notice of Preparation (NOP) was used to identify and incorporate concerns and recommendations of the public into the review and analysis of commercial herring regulation options.

The DED, a functional equivalent of an Environmental Impact Report, includes seven chapters. Chapter 1 discusses the authorities and responsibilities under which the DED was developed and describes its intended use. Chapter 2 describes the proposed project and alternatives for regulating the commercial harvest of herring. The existing environment is described in Chapter 3. The impacts of the proposed project are described in Chapter 4. Cumulative impacts are considered separately in Chapter 5. The alternatives to the proposed project including the "no project" alternative are assessed in Chapter 6. Chapter 7 identifies consultations. References used throughout the DED are listed in the Literature Cited section.

Based on the analysis in this DED, the proposed project is identified as the preferred alternative because it provides a set of regulations most likely to achieve the State's policy with respect to the conservation, maintenance and utilization of the Pacific herring resource.

S.2 Proposed Project

The proposed project is a body of recommended regulations governing the commercial harvest of herring for roe products, the harvest of herring eggs-on-kelp, and the harvest of herring for fresh food, bait, and pet food. The proposed project takes the form of recommendations for continuation, amendment, or change to an existing body of regulations in effect since 1997 (Sections 163 and 164, Title 14, California Code of Regulations (CCR)).

The commercial harvest of herring in California has been provided for by either Legislative or Fish and Game Commission regulatory action for over 100 years. The dominant product from the fishery has changed considerably over time with herring roe providing the dominant product at present. The herring roe fishery has been intensively regulated since its inception in the early 1970's. The proposed project has evolved, in large part, as a consequence of prior regulatory action.

The proposed project will establish fishing quotas by area and permit type for the 1998-99 herring fishing season, based on the most recent assessments of the spawning populations of herring in San Francisco and Tomales bays. Other changes relating to seasons, permittee qualifications, permit applications, the use of round haul gear, notice of kelp suspension, herring buyer's permits and penalties are recommended to improve the clarity of the regulations or provide for the efficient harvest and orderly conduct of the fishery and for the protection of the resource.

The specific changes recommended for the 1998-99 season will: provide three alternative fishing quotas for San Francisco Bay: 4,000 tons, 3,000 tons, and no fishery (20 percent, 15 percent, and zero percent of the estimated spawning biomass for the 1997-98 season); provide an initial 90-ton fishing quota for Tomales Bay with provisions to increase the quota in season if escapement goals are achieved by February 15, 1999; delete the requirement to validate permits each season, and delete penalties for not validating a permit; set the dates of the roe herring

fishery in Tomales Bay from 5:00 p.m. on Sunday, January 3, 1999 to noon on Friday, March 12, 1999; set the dates of the roe herring fisheries in San Francisco Bay from noon on Wednesday, December 2, 1998 to noon on Tuesday, December 22, 1998 ("DH" gill net platoon only), and from 5:00 p.m. on Sunday, January 3, 1999 to noon on Friday, March 12, 1999; remove all subsections of the regulations related to the use of round haul gear to take herring in San Francisco Bay, and all penalties specific to the use of round haul gear in the roe herring fishery; remove herring eggs on kelp quotas for individuals possessing round haul permits, since existing regulations provide that all San Francisco Bay round haul permits will be converted to gill net permits prior to the 1998-99 season; provide a means for changing the information given during a notice of kelp suspension if conditions change after notice has been given; delete the word "primary" from the listing of the type of license required for a herring buyer's permit, so that the name of the license is consistent with the name in the Fish and Game Code; and modify Section 163.5 to make the list of fish that cannot be taken while herring fishing consistent with the list in Section 163.

Other aspects of the regulations will remain unchanged. The regulations govern commercial herring activity in five geographically distinct areas. Withing these areas, several types of fishing activity can occur that produce distinctive products.

S.3 Project Alternatives

Three alternatives are considered; however, most take the form of additional proposals for modification of existing regulations. These alternatives include: 1) a no project alternative; 2) using existing regulations; and 3) establishing individual vessel quotas for gill net vessels in the herring roe fishery.

S.4 Existing Environment

The existing environment potentially affected by the proposed project and alternatives include the open ocean and bays in which herring occur. However, the environments most likely to be affected are the five geographically separate areas that actually support commercial herring fishing activity.

The open ocean harvest of herring for bait and pet food occurs primarily within Monterey Bay; however, harvest is permitted from the Monterey Bay area north to the California-Oregon border. The open ocean off-bottom (pelagic) habitat used by herring is characterized by complex alongshore currents that show marked seasonal phases. The animals and plants in this habitat also show marked seasonal changes in distribution and abundance. The herring landed in the Monterey Bay (open ocean) fishery account for only a small proportion (<2%) of the total herring commercial harvest.

Most commercial harvest of herring occurs in four isolated bays and estuaries in California and ultimately provides sac-roe as food. Herring use these bays and estuaries as spawning
grounds. Landing herring taken from the spawning grounds provides the highest quality product, most of which is exported to Japan.

Bays and estuaries, in general, share factors and processes that provide for a highly variable environment. For example, two current systems, fresh water outflow and oscillating tidal current, meet and exert variable effects upon sedimentation and water mixing. Animal and plant distribution and abundance are, as a consequence, also highly variable.

San Francisco Bay has supported the largest of these fisheries. The Tomales Bay area supports a moderate herring roe fishery, while both Humboldt Bay and the Crescent City area support small herring roe fisheries. A very diverse assemblage of organisms utilize both the

estuarine environment and the herring resource, including marine mammals, birds, and some fish species.

S.5 Environmental Impacts

S.5.1 Proposed Project

A preliminary assessment by the California Department of Fish and Game of potential impacts from existing commercial harvest of herring in each geographical area identified several areas of potential concern. The potential impacts varied with fishing intensity and geographical area. The area with the highest potential for impacts was the highly urbanized San Francisco Bay area that, coincidentally, supports the largest herring roe fishery in the State. Environmental impact assessment focused on this area.

Localized, short-term, and less than significant impacts were identified for several areas of potential concern including: boat and vehicle traffic circulation, water quality, air quality, housing and utilities, geology, scenic quality, recreation, and noise.

The greatest potential for significant environmental impact was deemed to be in the area of biology. Potential biological impacts were divided into two types: 1) direct harvest impacts and 2) trophic level (food web) impacts.

Potential direct harvest impacts included: 1) the effect of incidental take of other fish species, 2) the effect on fish resources from "ghost" net fishing, 3) the effect on herring stocks from regulating fisheries without stock assessment efforts, 4) the effect on all herring resources if non-harvest mortality (illegal and unreported harvest and natural mortality) exceeded assumed high natural mortality rates used in computer simulations.

Direct harvest impacts were considered to be localized, short-term, and less than significant. Mitigation of the potential long-term impacts on the herring resource from stock collapse is provided by the implementation of current management strategies and assessment techniques. Current management strategy sets harvest quotas (less than 20% of spawning population size) at a level that modeling indicates will provide for a sustained harvest. Use of spawn escapement and hydroacoustic assessment techniques provides data on trends in population size. Data obtained from these stock assessment techniques should herald any decline before the potential for a significant impact can be realized.

The harvest of herring also has the potential to affect a wide variety of species connected to herring through food web relationships. The abundance of herring, the relative abundance of predators, their proximity, predator food preferences, and competitive interactions all play a role in determining the importance of herring as prey. Generally, predator-prey systems in the marine environment that include top carnivores are stable because the system is relatively complex, the prey base is relatively broad, and the carnivores are capable of searching large areas.

No significant or long-term impacts to marine mammal, bird, or fish populations were identified associated with the commercial harvest of herring. The recognized herring predator populations were either increasing in size or have been found to be limited by factors other than food availability. However, individual predators may be affected to the extent that reduced herring availability influences search effort, prey selection, or capture effectiveness. These potential short-term, localized impacts to individuals are expected to be less than significant when considering impacts to populations.

S.5.2 Alternatives

Alternative 1 (no fishery)

Localized, short-term, and less than significant impacts to vessel and vehicle traffic

circulation, water quality, air quality, housing and utilities, scenic quality, recreational opportunities, and noise levels identified for the proposed project would be eliminated or redistributed in an unpredictable manner.

Potential biological impacts associated with a no project alternative include an increased rate of natural mortality, the potential for deterioration in the condition of the herring population as it reaches carrying capacity, and potential impacts to other species that compete with herring for food resources.

Alternative 2 (existing regulations)

In most regards, the environmental impacts will be comparable to those of the proposed project. However, existing regulations do not address certain fishery-related problems considered in amendments or changes to existing regulations. For example, if the San Francisco Bay quotas were not reduced, fishing mortality would be incrementally higher and the potential impact to the resource greater.

Alternative 3 (individual vessel quota)

Individual vessel quotas, rather than the platoon-based quota system currently used in the herring roe gill net fishery, would add incrementally to most impacts due to longer actual fishing seasons. The operating incentive would direct effort toward higher quality (e.g. higher percentage roe content) rather than quantity. However, these impacts are still expected to be short-term, localized, and less than significant for most environmental categories.

Wastage of resource could result from sorting to remove males from the catch to achieve higher roe content (and higher prices). However, fewer illegal nets are likely to be lost, reducing impacts from "ghost" net fishing.

S.5.3 Cumulative

A variety of factors have the capacity to influence Pacific herring population status in California in addition to the proposed project including: 1) biological events, 2) competitive interactions with other pelagic fish and fisheries, 3) oceanographic events, 4) habitat loss, and 5) water quality.

The potential for overfishing with concomitant stock reduction (stock collapse) associated with the on-going commercial harvest of herring was assessed using a computer simulation model. The model assumed a relatively high natural mortality rate ($M = 0.4$) for most simulations. If actual natural mortality exceeds the assumed rate, the assessment of the potential long-term impacts from use of the selected harvest strategy may not be valid. Several of the factors mentioned above can elevate natural mortality. Whether these factors could actually occur and what impact they might have on natural mortality rates is largely conjectural. However, as with potential impacts from the on-going commercial harvest of herring, continued monitoring of the herring resource should herald any directional trends long before the stocks reproductive potential would be jeopardized.

S.6 Areas of Controversy

The following areas of controversy have been identified regarding commercial herring fishing:

1. Potential interactions between marine mammals and commercial fishing activities;
2. Importance of herring as a forage species for sea birds, marine mammals, and other fishes;
3. Inadequate knowledge of the resource;

3. Errors in stock assessment;
4. Insufficient management resources;
4. Potential impact of unforeseen events or catastrophes (e.g. oil spills; chemical spills).

S.7 Issues to be Resolved

At issue is whether or not to provide for commercial fishing as an element of herring management in California. If commercial fishing is authorized, decisions are needed to specify the areas, seasons, fishing quotas and other appropriate special conditions under which fishing operations may be conducted. This document includes a review and discussion of the proposed project as well as alternatives.